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The Developmental Origins of Cognitive Vulnerability to Depression: Temperament, Parenting, and Negative Life Events in Childhood as Contributors to Negative Cognitive Style

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Cognitive models of depression have been well supported with adults, but the developmental origins of cognitive vulnerability are not well understood. The authors hypothesized that temperament, parenting, and negative life events in childhood would contribute to the development of cognitive style, with withdrawal negativity and negative parental feedback moderating the effects of negative life events to predict more depressogenic cognitive styles. These constructs were assessed in 289 children and their parents followed longitudinally from infancy to 5th grade; a subsample (n = 120) also participated in a behavioral task in which maternal feedback to child failure was observed. Results indicated that greater withdrawal negativity in interaction with negative life events was associated with more negative cognitive styles. Self-reported maternal anger expression and observed negative maternal feedback to child's failure significantly interacted with child's negative events to predict greater cognitive vulnerability. There was little evidence of paternal parenting predicting child negative cognitive style.

Keywords: cognitive vulnerability, temperament, parenting, stress

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Cognitive vulnerability–stress models of depression posit that individuals with certain maladaptive cognitive styles are more vulnerable to developing depression when they encounter negative life events. According to the hopelessness theory of depression (Abramson, Metalsky, & Alloy, 1989), individuals who make stable, global attributions, infer negative characteristics about the self, and anticipate negative consequences when negative life events occur are more likely to become depressed than individuals who do not exhibit this negative cognitive style. Prospective and retrospective tests of the hopelessness theory in adults and adolescents have supported the hypothesis that a negative cognitive style, in interaction with negative events, does confer vulnerability to depression (Abramson et al., 1999; Alloy et al., 2000; Alloy & Clements, 1998; Alloy, Lipman, & Abramson, 1992; Hankin, Abramson, & Siler, 2001; Metalsky & Joiner, 1992; Metalsky, Joiner, Hardin, & Abramson, 1993). Given extensive evidence linking negative cognitive style to depression, it is important to investigate the developmental origins of this cognitive vulnerability.

Several studies have attempted to identify predictors of the development of cognitive vulnerability to depression, but there are two salient limitations to the existing research (Alloy et al., 2001; Gibb et al., 2001; Kaslow, Tannenbaum, & Seligman, 1978; Rose, Abramson, Hodulik, Halberstadt, & Leff, 1994; Seligman et al., 1984; Turk & Bry, 1992). First, few investigators have attempted to prospectively predict the development of cognitive vulnerability (see Garber & Flynn, 2001, and Nolen-Hoeksema, Girgus, & Seligman, 1992, for exceptions). Second, although several factors related to the development of negative cognitive style have been identified, no theory-driven model has been proposed to explain the relationship of multiple factors to each other and to the outcome of negative cognitive style.

We addressed these limitations in the current study. We proposed and tested an integrated, developmental model of cognitive vulnerability to depression in which children are hypothesized to develop their unique cognitive style during the middle-to-late childhood period through their experiences with negative life events. The core premise of the model is that negative events in childhood provide the opportunity for children to learn and practice making inferences about cause, self, and consequences. We hypothesized that temperament and parenting would significantly moderate children's reactions to stressful life events such that children with temperaments high in withdrawal negativity or who receive parenting high in anger and negative inferential feedback would be vulnerable, when faced with negative life events, to developing more depressogenic cognitive styles. This model is consistent with a developmental psychopathology approach that examines the complex interaction of vulnerabilities at the biological, psychological, and social levels from a developmental perspective (see, e.g., Cicchetti & Toth, 1998).

Negative Life Events in Childhood

Negative life events play an important role in the current model for providing children with the opportunity to respond to and make

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inferences about negative events, a developmental process that will ultimately result in children's unique cognitive styles for negative events. We hypothesized that children who experience more negative events or who bring temperamental or parenting vulnerabilities to their encounters with negative events will be more likely to develop depressogenic cognitive styles. The majority of extant studies has hypothesized only a direct relationship between negative events in childhood and cognitive style and has not examined moderating factors. Rose and Abramson (1992) suggested that repeated or chronic negative life events in childhood may directly contribute to the development of a more negative cognitive style as children, over time, internalize the belief that negative events are stable, have negative consequences, and are attributable to aspects of themselves. Accordingly, Weisz and colleagues have demonstrated that perceived incompetence and perceived noncontingency of outcomes—perceptions that may be promoted by repeated, uncontrollable negative events—are associated with elevated depressive symptoms in children (Weisz, Sweeney, Proffitt, & Carr, 1993). Adults high in cognitive vulnerability retrospectively report more childhood maltreatment and negative life events than adults low in cognitive vulnerability (Gibb et al., 2001; Parker, Gladstone, Mitchell, Wilhelm, & Roy, 2000), and negative life events have been shown to prospectively predict a more depressogenic attributional style in children as well (Garber & Flynn, 2001; Nolen-Hoeksema et al., 1992). The relationship between negative life events and cognitive style does not apply only to at-risk children with very high childhood stress levels; a positive relationship between negative events and more depressogenic cognitive styles has been found when negative life events are assessed as chronic stressors (e.g., repeated abuse; Steel, Sanna, Hammond, Whipple, & Cross, 2004) in childhood, as salient negative events (e.g., sexual abuse; Rose et al., 1994), and as more typical stressful life events (e.g., Garber & Flynn, 2001).

In the current study, we hypothesized that, in addition to a direct relationship between negative events and cognitive vulnerability, the effects of negative events on the development of cognitive vulnerability would be moderated by child temperament and parenting.

Temperament

The proposed model builds on a well-established link between temperament and depression by suggesting that one pathway by which temperament is associated with depression is through a developmental association between temperament and cognitive vulnerability to depression. Several researchers have found that one temperamental characteristic in particular—withdrawal negativity—is associated with depression in adults, adolescents, and children (Clark, Watson, & Mineka, 1994; Colder, Mott, & Berman, 2002; Goodyer, Ashby, Altham, Vize, & Cooper, 1993; Kendler, Kessler, Neale, Heath, & Eaves, 1993; Roberts & Kendler, 1999; Rothbart & Bates, 1998).

Children with temperaments high in withdrawal negativity may be more emotionally reactive to negative life events and, thus, more likely to make depressogenic inferences about the causes and consequences of those events. Children high in withdrawal negativity typically dislike or avoid novel situations; show distress to novelty; become upset, fearful, sad, or tearful easily; and appear highly sensitive to negative stimuli (Belsky, Hsieh, & Crnic, 1996). Weiner (1985) noted that individuals' affective responses to negative events precede their cognitive response of making attributions for these events, and that the stronger the aversive affective reaction, the more likely people are to interpret events as catastrophic (Teasdale, 1988). Negative emotionality is also associated with greater attention to negative events (Derryberry & Reed, 1994); an increase in self-focus that is, in turn, associated with increased negative expectancies for the future (Pyszczynski, Holt, & Greenberg, 1987); and more focus on negative aspects of the self, other people, and the world (Watson & Clark, 1984). Developmentally, as children temperamentally high in withdrawal negativity are faced with negative life events, they may repeatedly make more negative inferences about those events that are evident in their emergent cognitive styles.

Very few investigators have examined the relationship between temperament and cognitive vulnerability to depression. Kashani, Soltys, Dandoy, and Vaidya (1991) found that children high in hopelessness reported more difficult temperament characteristics, particularly negative mood, low adaptability, and high withdrawal. However, children in that study reported on their own temperaments, and their self-evaluations may have been affected by their concurrent hopelessness and depression. Lengua, Sandler, West, Wolchik, and Curran (1999) found that children's cognitive appraisals of negative events mediated the relationship between negative emotionality and depression, even after controlling for children's ratings of how emotionally upset events made them. Thus, there is preliminary evidence that negative emotionality may be associated with making more negative cognitive evaluations of negative events.

Negative Parental Feedback

Several cognitive theorists have highlighted the importance of parent–child interactions in the development of cognitive vulnerability to depression (Ingram, 2003; Rose & Abramson, 1992), hypothesizing that parents provide their children with important feedback about the causes, consequences, and meaning of negative events that is internalized by the child into his or her own cognitive style for negative events. We hypothesized that receiving parental feedback that directly or implicitly suggests that negative events in the child's life are attributable to stable, global causes, implies negative characteristics about the child, or leads to negative consequences for the child would, in interaction with negative events in the child's life, predict more depressogenic cognitive styles.

The negative parental feedback hypothesis has received consistent, if limited, support. Studies have found positive correlations between children's attributional styles and parents' attributions for events in their children's lives (Garber & Flynn, 2001; Turk & Bry, 1992). Alloy et al. (2001) found that both mothers and fathers of college students with high cognitive vulnerability to depression reported that they provided more negative feedback about the causes and consequences of stressful events when the student was a child than did parents of students with low cognitive vulnerability. Although this hypothesis suggests an interaction between parental feedback and negative events, few researchers have examined this moderating relationship statistically. Crossfield, Alloy, Gibb, and Abramson (2002) reported an interaction between parental inferential feedback and negative life events in which high

levels of negative childhood life events in combination with negative maternal inferential feedback in childhood were associated with greater cognitive vulnerability to depression in adulthood.

Children's development of cognitive style may also be influenced by indirect feedback from the parents, such as a family environment high in parental criticism, anger, or hostility that conveys to the child that he or she is somehow deficient and to blame for negative events. Parental restrictiveness, rejection, low affection, and perfectionistic expectations in childhood have been associated with more depressogenic beliefs in adolescents and adults (Koestner, Zuroff, & Powers, 1991; Randolph & Dykman, 1998; Rose et al., 1994).

Most studies have examined only reported parental feedback, and few have directly observed parental direct and indirect feedback to negative events in children's lives. In the current study, we included both parent-reported and observed measures of parental feedback.

Gender Differences in Negative Cognitive Style in Children

In adolescence and adulthood, more females than males experience depression (Hankin et al., 2001). Hankin and Abramson (2001) suggested that gender differences in cognitive vulnerability might be an important mediator of the emergence of the gender difference in depression, and research with adults and adolescents has suggested that females have more negative cognitive styles than do males (Boggiano & Barrett, 1991; Hankin & Abramson, 2002). However, studies of gender differences in children's cognitive styles have yielded inconsistent findings. Some researchers have found that preadolescent boys display more maladaptive attributional styles for negative events than do girls (Nolen-Hoeksema et al., 1992), others that girls make more maladaptive attributions (Cole & Turner, 1993), and still others that there are no significant gender differences (Abela, 2001). Identifying when and how the gender difference in cognitive style develops may provide important insights into the processes by which the gender difference in depression emerges in adolescence. In the current study, we examined whether girls have more negative cognitive styles than boys at age 11 years.

Measurement of Negative Cognitive Style in Childhood

A major obstacle to examining cognitive vulnerability in children has been the lack of a reliable method for assessing it in preadolescents. Virtually all research examining cognitive style as a vulnerability factor for depression has used the Children's Attributional Style Questionnaire (CASQ; Kaslow et al., 1978) or its revised version (CASQ–R; Thomspon, Kaslow, Weiss, & Nolen-Hoeksema, 1998). Both the CASQ and CASQ–R have been plagued with low internal consistencies (α = .35–.60 in children 12 years old and younger; e.g., Abela, 2001; Nolen-Hoeksema et al., 1992). To address this problem, we developed and used a new measure of cognitive style among children, the Children's Cognitive Style Questionnaire (CCSQ).

The Current Study

Using a large community sample of 11-year-old children followed longitudinally since birth, we examined an integrated developmental model of the origins of cognitive vulnerability to depression. Specifically, we tested the following hypotheses:

Hypothesis 1: More negative events would predict more depressogenic cognitive styles.

Hypothesis 2: Higher withdrawal negativity, in interaction with negative events, would predict more depressogenic cognitive styles.

Hypothesis 3: More negative parenting, in interaction with negative events, would predict more depressogenic cognitive styles.

Method

Participants

Participants were 289 children and their parents who had participated in a longitudinal study of maternity leave, family, and work since pregnancy. Mothers were recruited during pregnancy for participation in the Wisconsin Maternity Leave and Health Project, now named the Wisconsin Study of Families and Work (Hyde, Klein, Essex, & Clark, 1995). Approximately 78% of the sample was recruited from the Milwaukee area and the remaining 22% came from the Madison area.

To be included in the project, participants had to meet the following criteria: (a) over age 18; (b) between 12 and 21 weeks pregnant; (c) living with the baby's father (though not necessarily married); (d) at least one member of the couple working for pay or profit; (e) not a student; (f) not unemployed and looking for work; (g) have a telephone to set up interview appointments; (h) speak English well enough to understand an interviewer; and (i) be sufficiently literate to complete self-report questionnaires (see Hyde et al., 1995, for additional details). All patients in the second trimester of pregnancy were identified daily by clinic staff, and a recruiter from the Wisconsin Study of Families and Work project approached them individually to explain the study. Of women eligible to participate, 75% agreed to do so. The current study included all participants from the original sample who participated in the relevant assessments through age 11; 289 children (149 girls), mothers, and/or fathers completed assessments when the child was the following ages: 1 year, 4.5 years, 9 years, and 11 years. Of the 289, 120 also participated in a videotaped mother–child interaction at age 9 that provided a behavioral measure of negative parental feedback. Demographic information on the full sample of 289 participants is provided in Table 1. There were no significant differences between the subsample who participated in the videotaped interaction and those who did not in any demographic or study variables.

Procedure

As part of the ongoing Wisconsin Study of Families and Work project, mothers, fathers, and children completed questionnaires during regularly scheduled assessments. For those children in the subsample, mother–child interactions were videotaped in the home when the child was 9 years old.

Measures

Cognitive vulnerability to depression. Children's inferential styles for negative events were assessed with the CCSQ, which we designed for this and related research on cognitive vulnerability to depression in children. The CCSQ is a self-report instrument. It was administered at ages 9 and 11 in a set of questionnaires presented to children on a laptop computer during regularly scheduled in-home interviews. In the CCSQ, children are presented with six scenarios (see the Appendix, which is available online). Four scenarios are the target negative scenarios used for computing the

Table 1
Demographic Information (N = 289)

Variable	%
Gender	
Girl (n = 148)	51.2
Boy (n = 141)	48.4
Mother education	
< high school	1.0
High school degree	16.0
Post-high school technical training	10.1
Some college	19.6
College degree	34.6
More than college	18.7
Father education	
< high school	3.7
High school degree	18.2
Post-high school technical training	9.3
Some college	20.2
College degree	27.2
More than college	21.6
Mother ethnicity	
Caucasian	92.9
African American	2.5
Native American	1.9
Hispanic	1.8
Asian American	0.9
Father ethnicity	
Caucasian	92.9
African American	3.9
Native American	0.9
Hispanic	1.0
Asian American	0.9
Other	0.4
Family income ($US; 1990)	
Mean	50,413
Range	7,500–200,000

child's negative cognitive style, and two are positive scenarios (included to avoid tiring the children with repeated negative events). Of the four negative scenarios, two assess cognitive style in response to achievement events and two assess cognitive style in response to interpersonal events. Accompanying each scenario are statements regarding the internality, stability, and globality of attributions (three items per scenario); self-inferences (one item); and anticipated consequences (one item). Each scenario contains one attribution emphasizing internality, one emphasizing stability, and one emphasizing globality; the dimension is emphasized by underlying the key words. Both within and across scenarios, the total number of internal, stable, and global attributions is counterbalanced. Children indicate agreement with each item on a 5-point scale from 1 (*don't agree at all*) to 5 (*agree a lot*).

Children's responses to the negative events items (20 items) are averaged for a negative cognitive style composite score. Higher scores on the CCSQ negative cognitive style composite indicate greater endorsement of internal, stable, global attributions, negative self-inferences, and negative inferred consequences in response to negative scenarios.

Construct validity and internal consistency of the CCSQ were demonstrated in the current sample. Construct validity was indicated by a significant interaction, as predicted from the cognitive vulnerability–stress component of the hopelessness theory of depression (Abramson et al., 1989), between CCSQ scores and negative life events in a multiple regression predicting depressive symptoms assessed by the Children's Depression Inventory (Kovacs, 1985) at age 11. The combination of high cognitive vulnerability scores and more negative life events was associated with elevated Children's Depression Inventory scores. The results of this regression analysis are shown in Table 2. The CCSQ also correlated significantly with children's attributional styles as measured by the CASQ–R at both age 9 and age 11 (Table 3). In the current sample, internal consistency reliability for the negative composite was .79 at age 9 and .84 at age 11. These compare with internal consistency reliabilities of .41 and .30 for the CASQ–R at the age 9 and 11 assessments, respectively. Two-year stability was significant but modest (r = .19, p < .05), as expected during this developmental period. In a separate sample of 8- to 12-year-old children (n = 48) recruited from the Madison, Wisconsin, area to examine psychometric properties of the CCSQ, results were very similar; internal consistency was .83 and 2-week test–retest reliability was .81. Taken together, these data indicate that the CCSQ is a reliable and valid measure of cognitive vulnerability to depression in children.

Negative life events. Children completed three measures of negative life events at age 11: Adolescent Perceived Events Scale (APES; Compas, Davis, Forsythe, & Wagner, 1987), American Association of University Women Survey of Sexual Harassment (AAUW; 2001), and Social Experience Questionnaire (Crick & Bigbee, 1998; Crick, Casas, & Nelson, 2002; Crick & Grotpeter, 1996). These measures assessed negative life events in three important domains: achievement, peer relationships, and family life. Children completed all three measures on a laptop computer at age 11.

Major and daily stressful events in the achievement and family domains were assessed with the young adolescent version of the APES. The full APES contains 159 major and daily life events. Respondents indicated for each event (a) whether it occurred in the past year, and if so, (b) their appraisal of the event on a 9-point scale of desirability from −4 (*very bad*) to 4 (*very good*). Test–retest reliability over 2 weeks for frequency of events was .84 and for ratings of desirability was .81 for young adolescents (Compas et al., 1987). Because of time constraints and concerns about participant exhaustion, we administered 59 of the original items. From the original version, we deleted items if they were redundant (e.g., "death of a relative" was deleted because it was redundant to "death of a family member," which was retained), age-inappropriate (e.g., "not attending high school prom"), or not likely to be rated as a negative event (e.g., "talking on the phone"). The remaining 59 items tapped stressful events in the achievement (30 items) and family (29 items) domains. Example items include "Parents getting divorced" and "Doing poorly on an exam or paper." In the current study, we examined only the frequency of negative life events. We created scores for the total frequency of negative events by counting all events rated −1 to −4 on the desirability scale separately for achievement and family events.

Negative life events with peers were assessed with two measures. The AAUW survey measures the frequency and impact of peer sexual harass-

Table 2
Hierarchical Regressions Testing the Children's Cognitive Style Questionnaire (CCSQ) × Negative Life Events (NLE) Interaction to Predict Depressive Symptoms (N = 289)

Predictor variable	Model 1	Model 2	Model 3
CCSQ	.33**	.23**	.23**
NLE			
Achievement		.03	.07
Family		.07	.39
Peer		.30**	.39**
CCSQ × NLE interactions			
CCSQ × Achievement NLE			.53**
CCSQ × Family NLE			.21
CCSQ × Peer NLE			1.18**
Adjusted R^2	.11	.20	.28
F	21.97**	12.21**	10.67**

Note. Values for each variable represent the standardized beta for the variable.
** p < .01.

Table 3
Correlations Among the Children's Cognitive Style Questionnaire (CCSQ) and Children's Attributional Style Questionnaire—Revised (CASQ–R)

Variable	1	2	3	4
1. CCSQ, age 9	—	.46*	.19*	.17†
2. CASQ–R, age 9		—	.06	.28*
3. CCSQ, age 11			—	.18*
4. CASQ–R, age 11				—

Note. $df = 287$.
† $p < .10$. * $p < .05$.

ment. The original survey, designed for older adolescents, includes 14 items. We deleted 5 items for reasons similar to those cited for the APES (items were inappropriate for 11-year-olds or were repetitive). We included 9 of the original items (e.g., spread sexual rumors about you; forced you to kiss him or her). For each item, the child indicated how often it had happened in the past year (*never*, *once*, *a few times*, or *several times*). If children indicated any response other than "never," they then rated how upset they had been by it (*not at all upset*, *somewhat upset*, *very upset*). In the current study, we examined only the occurrence of each form of sexual harassment. We created an occurrence score by counting the number of events endorsed as happening once, a few times, or several times.

The Social Experience Questionnaire assesses overt and relational nonsexual peer harassment. The Social Experience Questionnaire includes three overt aggression items (hit you; pushed or shoved you; kicked you or pulled your hair) and five relational aggression items (e.g., left you out on purpose when it's time to play or do an activity). Children indicated how often in the past year they had experienced each peer harassment item on a 5-point scale from 1 (*never*) to 5 (*always*). Internal consistency for the Overt Aggression scale was .82 and for the Relational Aggression scale was .80.

The three peer negative life event scales (AAUW survey, Crick Overt Aggression, and Crick Relational Aggression) were z scored and averaged to create a composite peer negative life event score.

Temperament. Child temperament at age 1 was measured using the Infant Behavior Questionnaire (IBQ; Rothbart, 1981, 1986), which is a structured parental report questionnaire. The IBQ was provided to mothers by mail. The IBQ consists of 94 items, 86 of which were used in this study. Eight items were deleted to shorten the questionnaire while maintaining adequate internal consistency. A sample item is "How often did your baby fuss, cry, or show distress while waiting for food?" Mothers reported on each item for the previous 2 weeks on a 1 (*never*) to 7 (*always*) scale. The IBQ yields seven scales: Activity Level, Smiling and Laughter, Fear/Distress to Novelty, Distress to Limitations, Soothability, Duration of Orienting, and Startle. Rothbart (1981) reported internal consistencies for each scale with coefficient alphas ranging from .67 to .85, with a mean alpha of .78. From these subscales, summary scales were developed to identify domains that were theoretically compatible with conceptions of emotional reactivity. In the current study, we used the Withdrawal Negativity summary scale (a composite of Fear/Distress to Novelty and Startle; 21 items). The 21 items were averaged to create the withdrawal negativity score. In the current sample, alpha for withdrawal negativity was .73.

Child temperament at 4.5 years was measured using the Child Behavior Questionnaire (Rothbart, Ahadi, & Hersey, 2001), which is similar to the IBQ but more appropriate for the assessment of children ages 3 to 7 years. The Child Behavior Questionnaire was provided to mothers in a packet of mailed questionnaires. Mothers reported on 80 items, rating how true or untrue each was of their children from 1 (*extremely untrue*) to 7 (*extremely true*) within the past 6 months. A sample item is "Becomes upset when loved ones or friends are getting ready to leave after a visit." In the current study, we again used the withdrawal negativity summary scale (composite of the Fear, Sadness, and Shyness scales; 22 items). The 22 items were averaged to create the withdrawal negativity score. In the current sample, alpha for withdrawal negativity was .82.

To better represent the stability of individual differences in temperament across childhood, the two assessments of temperament (ages 1 year and 4.5 years) were combined to yield one summary score of withdrawal negativity for each child. To create the summary scores, children's scores at 1 year and at 4.5 years were transformed into z scores and then averaged.

Negative parental feedback: Self-report. Negative parental feedback was assessed in several ways when the child was 9 years old. First, parents completed two measures that assessed the overall quality of parenting and amount of negative affect expressed. The overall negative affect and restrictiveness of parenting beliefs was assessed by the Child-Rearing Practices Report (Block, 1965), which both mothers and fathers completed when the children were 9 as part of a packet of mailed questionnaires. We administered 58 of the original 91-item questionnaire. In the current study, we computed two scales: Negative Affect Toward Child, which included 7 items (e.g., "I often feel disappointed in my child"), and Control Orientation, which included 14 items (e.g., "I have strict rules for my child" and "I do not allow my child to question my decisions"). For each scale, items were averaged to create scale scores. In our sample, internal consistency reliability for mothers was .73 for the Negative Affect scale and .73 for the Control Orientation scale. Internal consistency reliability for fathers was .71 for the Negative Affect scale and .72 for the Control Orientation scale.

Parental expression of negative affect was assessed by the State–Trait Anger Expression Inventory (Spielberger, 1988), which was also included in a packet of mailed questionnaires when children were 9. The State–Trait Anger Expression Inventory is a 24-item measure assessing how adults typically express anger. Parents rated each item on a 4-point scale from 1 (*almost never*) to 4 (*almost always*). Factor analysis has identified several factors (Forgays, Forgays, & Spielberger, 1997). In the current study, we used the Anger Expression Out factor (8 items), which assesses whether parents typically express their anger through actions or words that are apparent to others. Sample items include "I say nasty things" and "I slam doors." The 8 items were averaged to create the Anger Expression Out score. In the current sample, the internal consistency of the Anger Expression Out scale was .76 for mothers and .75 for fathers.

Negative parental feedback: Observational measure. To directly assess maternal negative feedback to children following a negative event in the child's life, 120 of the children and their mothers participated in a behavioral task when the children were 9. This task was administered and videotaped in the family's home. Mothers watched while children completed a math task on a laptop computer, which had been programmed to be difficult for most children. Regardless of their actual performance, all children received a low score (2 stars out of a possible 7). Following the problem set, mother–child pairs were given 2 min to "discuss the problem set and the child's score."

To assess mothers' verbal inferential feedback, the discussion period was transcribed and coded by undergraduate research assistants in a manner similar to the content analysis of verbatim explanation technique (Peterson, Luborsky, & Seligman, 1983). Coders first identified all codable statements made by the mother. To be codable, statements had to refer to the child or the child's performance or score in this task. The following categories of statements were identified:

1. Attribution inferences: statements that included a causal explanation for the child's score or performance, stated either directly or clearly inferred. An example is "You got 2 stars because you didn't pay attention to what you were doing." Attributions were first coded for internality, stability, and globality on 5-point scales, with higher scores indicating more internal, stable, or global attributions (e.g., 1 = *very external* to 5 = *very internal*). Then, attributions for which two or more dimensions were rated

as 3 or higher were coded as negative (–1) and all other attributions were coded as positive (1).

2. Nonattributional negative statements: statements that contained information about the child as a person, such as his or her strengths, weaknesses, or preferences, or that inferred positive or negative consequences or other evaluation. Examples include "You have a hard time following directions," "You need to work on math or you'll have a hard time in school," and "2 stars isn't very good," which were categorized as negative (–1), neutral (0), or positive (1).

From these statement categories and ratings, summary scores were created for total negative attribution inferences and total negative nonattributional statements.

To assess mothers' affective feedback, the discussion period was coded from tape by undergraduate research assistants for specific affect expressed by the mother, using a coding system derived from Gottman's Specific Affect Coding System (Gottman, 1993). Coders first identified codable units. Units were typically sentences but could also be sentence fragments, brief utterances, or a period of time in which there was no conversation. Using nonverbal and verbal cues, such as gestures, tone of voice, and body positioning, we identified the mother's affect during each discrete unit (Gottman, 1993). In the current study, we coded only externalizing negative affect (frustration, disgust, and anger), creating one score representing the total number of externalizing negative affect units.

Two raters participated in more than 100 hr of training and rating pilot tapes during the training period. After group training, raters had to demonstrate reliability, with criterion set at .80 categorical agreement with the trainer (Amy H. Mezulis). During coding, percentage agreement between raters was computed for statement identification and categorization, statement codings, and affect codings. Interrater reliability for identifying codable statements was .82; for categorizing and coding statements, reliability ranged from .92 to .99. Interrater reliability for affect coding was .86.

Data Analysis

To address hypotheses regarding the contributions of child temperament, parenting, and negative life events on children's negative cognitive style, hierarchical multiple regression was selected. All variables were centered prior to analyses.

We examined the effects of both interactions simultaneously on children's negative cognitive styles. In these models, temperament was entered in the first step, parenting in the second step, negative life events in the third step, and all interactions in subsequent steps. To compensate for Type I error potential given the large number of interactions examined, interactions were entered in conceptually relevant blocks, and the significance of specific interactions was interpreted only if the block as a whole contributed significantly to explaining variance in the model. In the full model, the interaction blocks were as follows: temperament–event interactions, maternal parenting–event interactions, and paternal parenting–event interactions. In the model for the subsample with behavioral data available, the interaction blocks were temperament–event interactions, maternal self-report parenting–event interactions, maternal behavioral parenting–event interactions, and paternal parenting–event interactions.

Results

One-way analyses of variance comparing the subsample (n = 120) with the complete sample (N = 289) found no significant differences on any of the variables listed in Table 1. Descriptive statistics and correlations for study variables are provided in Table 4.

Gender differences for all study variables are shown in Table 5. At age 1 year, girls had more withdrawal negativity than boys, although this gender difference was not present at 4 years. Boys reported more overt peer harassment and more sexual peer harassment; there were trends for boys' fathers to display more negative affect and control than girls' fathers. There was a marginally significant trend for boys to have more negative cognitive styles than girls at age 11. These results suggest that the expected gender difference in cognitive style (i.e., that girls have more negative cognitive style than boys, as is the case in adolescence and adulthood) has not emerged by age 11. To take into account the trend for boys to have more negative cognitive styles, gender was entered into the regression models in the first step.

The full model predicted 27% of the variance in children's negative cognitive styles at age 11 (Table 6). Peer harassment was a significant predictor of more negative cognitive styles. Three interactions were also significant: Temperament × Peer Harassment, Temperament × Negative Achievement Events, and Maternal Anger Expression × Peer Harassment. These interactions are displayed graphically in Figures 1, 2, and 3. All interactions were in the predicted direction, with higher levels of the moderating factors interacting with higher levels of negative events predicting the most negative cognitive styles. For both interactions involving peer harassment events (see Figures 1 and 3), there was a main effect of peer harassment as well as a significant interaction, so that children with high levels of negative events in this domain had greater cognitive vulnerability than children with low levels of negative events in this domain, with children with both high levels of negative peer events and high withdrawal negativity having the most negative cognitive styles. For the significant interaction involving achievement events (see Figure 2), there was no significant main effect of event type. Children with high withdrawal negativity who experienced higher levels of negative achievement events had the most negative cognitive styles, whereas children with low withdrawal negativity who experienced higher levels of negative achievement events had the least negative cognitive styles.

We also examined an integrated model for the 120 children who participated in the behavioral task (Table 7). This model predicted 29% of the variance in children's negative cognitive styles. Peer harassment remained a significant predictor of cognitive vulnerability to depression. The two-way interaction of temperament and peer negative events was significant, as was the interaction of temperament and achievement negative events. The two-way interaction of maternal anger expression and peer negative events was again significant in this model. Finally, we observed a trend for observed maternal negative feedback to interact with negative life events to predict children's cognitive style. There were two significant interactions between mothers' negative attributions in the behavioral task and children's negative life events, with mothers' negative attributions interacting significantly with negative events in the family and peer domains to predict children's cognitive styles. However, these final interactions must be interpreted cautiously as the regression block as a whole reached only marginal significance (p = .07).

Table 4
Correlations, Means, and Standard Deviations Among Major Study Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	*M*	*SD*
1. CCSQ	—	.01	.02	.07	.08	.12*	.08	.06	.09	.01	−.04	−.05	.13*	.10†	.33**	.35**	.29**	1.88	0.66
2. WN, 1 year		—	.29**	.08	.02	.06	.01	.03	−.02	.03	−.04	−.03	.00	.05	.06	−.02	.10	2.86	0.81
3. WN, 4.5 yr.			—	.06	−.07	.11*	.02	−.06	−.16	−.01	−.09	−.08	−.06	.03	.01	−.03	.01	3.86	0.75
4. CRPR Neg Aff, M				—	.43**	.26**	.18*	.06	.07	.23**	.05	.14*	.08	.21**	.06	.16**	.07	2.09	0.67
5. CRPR Control, M					—	.17**	.08	−.06	.17*	.16**	.32**	.06	.15**	.10*	.08	.19**	.14*	3.62	0.66
6. Anger Exp, M						—	.07	.04	.01	.08	.06	.12*	.12*	.11†	.00	.00	.07	14.46	3.18
7. Neg State, M							—	.13	.25**	.11	.16	.04	.06	.03	.11	.20*	.11	13.7	NA
8. Neg Attrib, M								—	.08	−.08	.02	−.01	.21**	.15**	.06	.07	.01	19.8	NA
9. Neg Affect Ext, M									—	.00	−.01	−.05	.24**	.16*	.17*	.13	.23*	1.86	2.62
10. CRPR Neg Aff, F										—	.30**	.34**	.04	.06	.03	.00	.00	2.28	0.64
11. CRPR Control, F											—	.19**	.12*	−.01	.06	.10	.14*	4.03	0.68
12. Anger Exp, F												—	.00	.02	−.09	−.08	−.12†	15.51	3.39
13. Family NLE													—	.30**	.31**	.27**	.36**	2.69	2.56
14. Achiev NLE														—	.23**	.31**	.26**	1.09	1.29
15. Rel Agg															—	.62**	.49**	0.52	0.61
16. Overt Agg																—	.53**	0.70	0.84
17. Sex Har																	—	1.31	1.72

Note. For variables scored dichotomously, percent with a score of "1" is noted. $df = 33, 254$ (final model); CCSQ = Children's Cognitive Style Questionnaire (age 11); WN = child temperament withdrawal negativity composite score; CRPR neg aff = Mother (M) or father (F) scores on the Childrearing Practices Report Negative Affect Toward Child scale; CRPR control = Mother (M) or father (F) scores on the CRPR Control scale; Anger Exp = Mother (M) or father (F) scores on the Anger Expression Out scale of the State–Trait Anger Expression Inventory; Neg state = Mother's negative statements to the child following failure on behavioral task ($n = 120$); Neg attrib = Mother's negative attributions to the child following failure on behavioral task ($n = 120$); Neg affect ext = Mother's negative affect to child following failure on behavioral task ($n = 120$); Family NLE = Family negative life events; Achieve NLE = Achievement negative life events; Rel agg = Crick relational peer aggression score; Overt agg = Crick's overt peer aggression score; Sex har = frequency of sexual harassment on the American Association of University Women Survey of Sexual Harassment; NA = not applicable.
† $p < .10$. * $p < .05$. ** $p < .01$.

Table 5
Means and Standard Deviations for Gender Differences in Study Variables

Variable	Boys		Girls		
	M	*SD*	*M*	*SD*	*t*
Withdrawal negativity (1 year)	3.21	0.68	3.44	0.78	2.00*
Withdrawal negativity (4 years)	3.81	0.74	3.93	0.74	1.40
Maternal negative affect (CRPR)	2.10	0.67	2.06	0.66	.53
Maternal control (CRPR)	3.65	0.65	3.61	0.67	.57
Maternal anger expression	14.63	2.99	14.26	3.36	1.02
Paternal negative affect (CRPR)	2.35	0.67	2.20	0.62	1.79†
Paternal control (CRPR)	4.11	0.65	3.95	0.70	1.79†
Paternal anger expression	15.60	3.71	15.39	3.10	.46
Maternal negative attributions for failure (observational task)	0.12	0.32	0.14	0.35	.64
Maternal negative statements for failure (observational task)	0.25	0.44	0.16	0.37	1.26
Maternal negative affect for failure (observational task)	1.19	1.96	0.61	1.27	1.92†
Peer harassment: Overt	0.89	0.85	0.50	0.76	4.36**
Peer harassment: Relational	0.55	0.63	0.49	0.59	.91
Peer harassment: Sexual	1.52	1.81	1.10	1.63	2.20*
Negative family life events	2.62	2.59	2.76	2.54	.48
Negative achievement life events	1.16	1.40	1.02	1.62	.96
Negative cognitive style (CCSQ)	1.95	0.54	1.85	0.40	2.16†
Children's Depression Inventory	3.70	4.43	3.53	4.53	.25

Note. $df = 42, 245$ (final model). CRPR = Child-Rearing Practices Report; CCSQ = Children's Cognitive Style Questionnaire.
† $p < .10$. * $p < .05$. ** $p < .01$.

Discussion

In this study, we proposed and examined a model of the development of depressogenic cognitive styles. We hypothesized that child temperament, parenting, and negative life events would contribute to a cognitive style in a moderator model in which withdrawal negativity and negative parental feedback would moderate the effects of negative life events to predict more depressogenic cognitive styles. These hypotheses were supported. Negative life events, temperament, and parenting, alone and in interaction with each other, predicted 27% of the variance in children's cognitive styles at age 11.

Negative Life Events and Cognitive Vulnerability to Depression

Previous studies have demonstrated that more negative life events in childhood and early adolescence are associated with greater cognitive vulnerability to depression (Garber & Flynn, 2001; Nolen-Hoeksema et al., 1992). Our findings extend prior research by highlighting which domains of negative life events show the strongest relationship to cognitive vulnerability, either alone or in interaction with moderating factors. The most notable finding was the strong relationship between peer harassment—including sexual harassment by peers, overt peer aggression, and relational peer aggression—and cognitive vulnerability to depression in children. Negative peer events were both directly predictive of more negative cognitive styles and interacted with moderating factors (child temperament and maternal anger expression) to predict greater cognitive vulnerability.

Our results are consistent with recent studies examining the relationship between verbal peer victimization and cognitive vulnerability to depression and serve to underscore this previously underexamined risk factor for cognitive vulnerability. Gibb, Alloy, Abramson and Marx (2003) and Gibb, Abramson, and Alloy (2004), in two studies with college students, found that college students who retrospectively reported greater peer victimization in childhood or adolescence (in one study, prior to age 18, and in the other study, prior to age 15) had more negative cognitive styles. Several previous studies have established that peer rejection and victimization may predict depression (Hawker & Boulton, 2000; Rudolph, Hammen, & Burge, 1994). However, the current study, in conjunction with the Gibb et al. (2004) studies, suggests that the relationship between peer victimization and depression may be mediated by cognitive vulnerability. Although negative achievement and family events did interact with other moderating factors to predict cognitive style, neither had a significant main effect on cognitive style, and interactions with moderating factors were less consistent across models. It may be an unfortunate developmental coincidence that cognitive vulnerability to depression is developing and crystallizing during the transition from middle childhood to adolescence when peers exert such a strong influence on child development (Cole, Maxwell, & Martin, 1997).

Temperament Moderates the Effect of Negative Life Events on Predicting Children's Cognitive Styles

Results of this study provide strong support for the hypothesis that children with temperaments high in withdrawal negativity, when faced with negative life events, are more likely to develop a depressogenic explanatory style for negative events. These results may provide an important contribution to better understanding the well-established relationship between temperament and depression by demonstrating that a temperament high in withdrawal negativity may confer vulnerability for developing a depressogenic cognitive style.

Table 6
Hierarchical Regressions Testing the Integrated Model

Predictor variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Gender	.17*	.17*	.08	.03	.07	.03	.03
Withdrawal negativity (WN)		.05	.03	.00	.03	.01	.03
Negative parenting							
Maternal CRPR negative affect			.08	.06	.08	.07	.08
Maternal CRPR control			.03	.03	−.06	−.08	−.06
Maternal anger expression			.02	.01	.05	.06	.05
Paternal CRPR negative affect			.00	.01	.02	.04	.01
Paternal CRPR control			−.07	−.12	−.12	−.09	−.12
Paternal anger expression			.07	.01	.05	.02	.05
Negative life events (NLE)							
Achievement				−.06	−.14	−.12	−.11
Family				−.05	.01	.01	.01
Peer				.53**	.49**	.52**	.49**
Two-way interactions							
Block 1: Temperament × Event interactions							
WN × Achievement					.13*		
WN × Family					−.01		
WN × Peer					.14*		
Block 2: Maternal Parenting × Event interactions							
Maternal Negative Affect × Achievement						.03	
Maternal Negative Affect × Family						−.04	
Maternal Negative Affect × Peer						−.05	
Maternal Control × Achievement						.04	
Maternal Control × Family						−.01	
Maternal Control × Peer						−.06	
Maternal Anger Expression × Achievement						.08	
Maternal Anger Expression × Family						.06	
Maternal Anger Expression × Peer						.14*	
Block 3: Paternal Parenting × Event interactions							
Paternal Negative Affect × Achievement							.05
Paternal Negative Affect × Family							−.05
Paternal Negative Affect × Peer							−.06
Paternal Control × Achievement							.05
Paternal Control × Family							−.01
Paternal Control × Peer							−.11†
Paternal Anger Expression × Achievement							.02
Paternal Anger Expression × Family							.03
Paternal Anger Expression × Peer							−.06
Adjusted R^2	.02	.02	.01	.24	.26	.28	.27
F change	4.24**	.64	.61	22.15**	2.72*	1.96*	.83
F	4.24*	3.43*	1.31	7.27**	6.44**	4.73**	3.61**

Note. Values for each variable represent the standardized beta for the variable. df = 31, 258. CRPR = Child Rearing Practices Report.
† $p < .10$. * $p < .05$. ** $p < .01$.

This was the first study to directly examine whether there is a relationship between temperament and cognitive style. A priori, there were multiple potential relationships between temperament and cognitive vulnerability to depression. One possibility was that temperament would be a substrate out of which cognitive vulnerability to depression develops. This hypothesis predicts a main effect of temperament in predicting cognitive style, which we did not find. A second possibility was that individuals high in withdrawal negativity would experience more negative life events that would, in turn, predict a more negative cognitive style. Children high in withdrawal negativity may elicit more negative interactions with parents and peers (see, e.g., Finch & Graziano, 2001). However, our results do not support this hypothesis either; correlational analyses demonstrated that temperament was not significantly associated with children's self-reported negative life events.

Our results instead support a third relationship between temperament and cognitive vulnerability to depression in which temperament moderates children's experience of negative life events to predict cognitive style. Negative emotionality has been associated with greater attention to negative events (Derryberry & Reed, 1994) and an increase in self-focus; this deployment of attention toward negative events and the self is, in turn, associated with increased negative expectancies for the future (Pyszczynski et al., 1987) and more focus on negative aspects of the self, other people, and the world (Watson & Clark, 1984). This may result in more negative interpretations of the event. When this process happens in childhood, the repeated experience of negative events for children high in emotionality may be associated with the repeated experience of making negative inferences for these events that, over time, crystallizes into a more depressogenic cognitive style for all negative events.

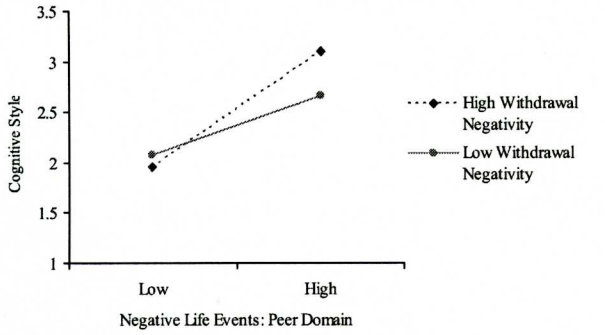

Figure 1. Significant temperament–negative peer domain life event interactions predicting child cognitive vulnerability to depression. Interactions are graphed using values for 1 standard deviation above and below the mean on each predictor variable.

Our findings support this third moderator hypothesis by demonstrating that temperament moderated the effects of negative events on the development of cognitive vulnerability to depression. This was particularly apparent in the significant interactions between negative peer events and child temperament in predicting cognitive style; although all children experiencing higher levels of negative peer events had more negative cognitive styles compared with children experiencing lower levels of these events, this effect was particularly pronounced for children high in withdrawal negativity, suggesting a greater vulnerability in these children to the effects of negative events in this domain on their development of cognitive style. The combined effects of negative achievement events and withdrawal negativity were less clear; although children high in withdrawal negativity who experienced higher levels of negative events in this domain had the most negative cognitive styles, it also appeared that children low in withdrawal negativity who experienced higher levels of negative events in the achievement domain had the least negative cognitive styles. It may be that the achievement domain is relatively less salient in the prediction of cognitive style at this age; it may also be that children temperamentally low in withdrawal negativity have other protective factors influencing how negative achievement events affect their

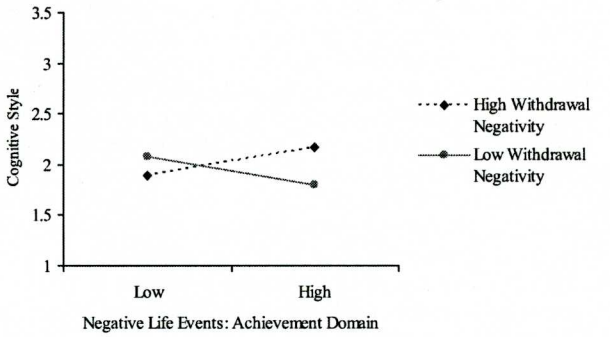

Figure 2. Significant temperament–negative achievement domain life event interactions predicting child cognitive vulnerability to depression. Interactions are graphed using values for 1 standard deviation above and below the mean on each predictor variable.

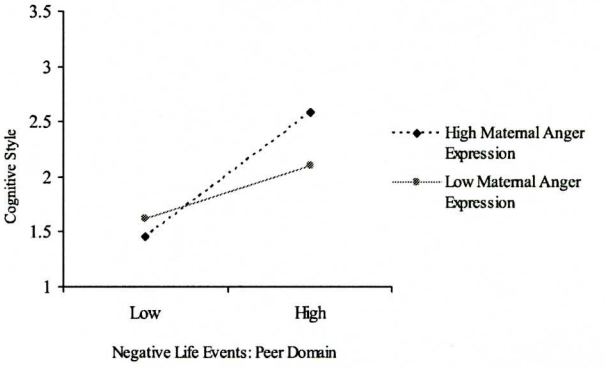

Figure 3. Significant parenting–negative life event interaction predicting child cognitive vulnerability to depression. Interactions are graphed using values for 1 standard deviation above and below the mean on each predictor variable.

development of cognitive style. For example, these children may be more receptive to supportive parenting in the context of these events. The differential effects of negative events in distinct domains on children who are high and low in temperamental vulnerability bear further examination in future studies.

Negative Parenting Moderates the Effect of Negative Life Events on Predicting Children's Cognitive Styles

We hypothesized that negative parenting (e.g., high anger expression, high negative affect toward the child, and negative inferential feedback about negative events) would contribute to the development of more negative cognitive styles such that children receiving parenting high in these characteristics, when faced with negative life events, would be more likely to develop cognitive vulnerability to depression. We examined this hypothesis in two ways, first by using only parental self-report measures of parenting and second by including (for a subsample) behavioral measures of parental responses to a child negative event.

There were several interesting findings about the relationship between parenting and child cognitive vulnerability to depression. First, there was stronger support for a relationship between negative maternal parenting and child cognitive style than for a relationship between negative paternal parenting and child cognitive style. This is perhaps not surprising, given that extensive research on division of labor in families has shown that mothers provide the majority of the child care, even when both parents are working full time (Sandberg & Hofferth, 2001).

Second, the behavioral measure of maternal parenting provided an additional perspective on the relationship between parenting and cognitive style. In the final integrated maternal model for this subsample, there was a trend for mothers' negative attributions for children's failure on a behavioral math task to interact with negative events in the family and peer domains to predict more negative cognitive styles; this trend failed to fully reach significance and should be replicated in future studies before firm conclusions are drawn. However, these findings provide the first behavioral support to date for the hypothesis that observable negative parental feedback about the causes and consequences of

Table 7
Hierarchical Regression of Integrated Model, Including Mothers' Negative Feedback in Behavioral Task (n = 120)

Predictor variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Gender	.25*	.25*	.27*	.18*	.15	.07	.06	.01
Withdrawal negativity (WN)		.05	.03	.00	.03	.01	.03	.04
Negative parenting								
Maternal CRPR negative affect			.09	.04	.06	.05	.03	.02
Maternal CRPR control			.17	.12	.07	.02	.05	.04
Maternal anger expression			.07	.01	.16	.16	.17	.15
Negative attributions			.09	.06	.08	.06	.05	.04
Negative statements			.11	.06	.15	.09	.10	.07
Negative affect to failure			.00	.03	.08	.06	.07	.06
Paternal CRPR negative affect			.10	.14	.08	.01	.01	.01
Paternal CRPR control			−.07	−.23†	−.20	−.24*	−.22†	.29†
Paternal anger expression			.01	.08	.07	.05	.05	.02
Negative life events (NLE)								
Achievement				.15	−.24	−.12	−.17	−.32*
Family				.05	.07	.19	.21	.11
Peer				.53**	.65**	.60**	.61**	.58**
Two-way interactions								
Block 1: Temperament × Event interactions								
WN × Achievement					.20*			
WN × Family					−.01			
WN × Peer					.21*			
Block 2: Maternal Self-Reported Parenting × Event interactions								
Maternal Negative Affect × Achievement								.05
Maternal Negative Affect × Family								−.18
Maternal Negative Affect × Peer								.16
Maternal Control × Achievement								.12
Maternal Control × Family								−.01
Maternal Control × Peer								−.10
Maternal Anger Expression × Achievement								.03
Maternal Anger Expression × Family								.04
Maternal Anger Expression × Peer								.14*
Block 3: Maternal Observed Parenting × Event interactions								
Negative Attributions × Achievement								.07
Negative Attributions × Family								.26*
Negative Attributions × Peer								.33*
Negative Statements × Achievement								.04
Negative Statements × Family								.17
Negative Statements × Peer								.22
Negative Affect After Failure × Achievement								.15
Negative Affect After Failure × Family								.17
Negative Affect After Failure × Peer								.22*
Block 4: Paternal Parenting × Event interactions								
Paternal Negative Affect × Achievement								−.17
Paternal Negative Affect × Family								−.09
Paternal Negative Affect × Peer								−.09
Paternal Control × Achievement								.05
Paternal Control × Family								−.11
Paternal Control × Peer								−.12
Paternal Anger Expression × Achievement								.09
Paternal Anger Expression × Family								.02
Paternal Anger Expression × Peer								.09
Adjusted R^2	.05	.04	.05	.28	.31	.35	.30	.29
F change	4.28**	.10	1.17	9.67**	2.75*	2.06*	1.86†	.86
F	4.28*	3.16*	1.67	4.23**	4.02**	3.22**	2.26**	1.92*

Note. Values for each variable represent the standardized beta for the variable. df = 43, 77. CRPR = Child Rearing Practices Report.
† $p < .10$. * $p < .05$. ** $p < .01$.

negative events in the child's life is associated with more negative cognitive styles in children. This finding elaborates on previous studies that have demonstrated that parents' or children's self-reports of negative parental feedback to negative events in the child's life are associated with more negative cognitive styles (Alloy et al., 2001; Turk & Bry, 1992).

Limitations

Although the findings from the current study strongly support the integrated developmental model of cognitive vulnerability to depression posed here, their limitations should be noted. First, several findings rely on participants' self-report, and

more data were available from mothers than from fathers. The behavioral data strengthen the findings with multimethod assessment. Future studies should continue to examine the relationship between parenting, life events, and child cognitive vulnerability with behavioral measures administered to both mothers and fathers.

Second, this study was conducted with a community sample using only a measure of recently experienced negative events. Thus, it provides limited information about the temporal sequencing of negative life events and the development of cognitive vulnerability, and the relationship between childhood negative events and cognitive style was not exhaustively examined. Children reported on their cognitive vulnerability at age 11 and on negative life events in the past year, or from age 10 to 11. The overlap in time frame does not preclude the interpretation that the causal direction is opposite to what we have hypothesized and that, in fact, children's negative cognitive style contributes to the occurrence of negative life events. This possibility is rendered less likely by the measurement of moderating factors in infancy (temperament) and at age 10 (parenting), for which interactions with negative life events were significant even after controlling for the main effects of life events on cognitive style. Future studies should examine change in cognitive vulnerability as a function of the occurrence of negative life events during the interval between two assessments of cognitive style. Also, it remains an open question whether there are more salient periods developmentally during which negative events exert a greater influence on the development of cognitive style, and future studies should consider whether negative events earlier or later in childhood and adolescence also affect the development of negative cognitive style.

Third, the relative lack of ethnic diversity in the sample is a limitation to generalizing these findings to other samples. Few studies have examined cognitive vulnerability among ethnically diverse samples. A recent meta-analysis examining the positivity bias in attributions found nonsignificant trends for African Americans to be more positive (suggesting less cognitive vulnerability to depression) and Asian Americans to be less positive (suggesting greater cognitive vulnerability to depression) than White Americans (Mezulis, Abramson, Hyde, & Hankin, 2004), but the paucity of studies made drawing definitive conclusions impossible. Parenting practices also differ among ethnic groups. Future studies should continue to expand this research to ethnically diverse samples.

Finally, it is important to note that the developmental pathways to adolescent and adult depression are many and varied, and the depressogenic cognitive style under examination here is only one of many potential pathways. Genetic and hormonal factors undoubtedly play a significant role in the etiology of depression, and even contributing factors examined here (parenting, peers, negative events, and temperament) may contribute to depression in ways not involving cognitive vulnerability. Continued research on the role of cognitive vulnerability and other etiologic pathways to depression is critical to better understanding the development of risk for depression.

Implications of the Current Study for Future Research

The current study not only contributes to a better understanding of the developmental origins of cognitive vulnerability to depression but also to a better understanding of risk for depression more generally. Our study elaborates on the mechanisms by which stressful life events provide risk for depression vulnerability and how this risk is moderated by other vulnerability-inducing factors. In this way, our research parallels recent interest in examining gene–stress interactions in predicting depression, with several studies now documenting that the effect of life stress on depression is moderated by a polymorphism of the 5HTTLPR promoter region of the serotonin transporter gene (see, e.g., Caspi et al., 2003; Kendler, Kuhn, Vittum, Prescott, & Riley, 2005). Although the developmental pathway from the 5HTTLPR polymorphism to depression has not been identified, one possibility is that this serotonin transporter gene may be implicated in temperament. At least one study has found that the 5HTTLPR polymorphism was associated with greater negative emotionality and distress to novelty in infants (Auerbach et al., 1999). It is interesting to speculate that our finding of a temperament–stress interaction in predicting risk for depression in children may have a parallel in research examining gene–stress interactions in predicting risk for depression. Finally, given our finding that childhood temperament is associated with increased vulnerability to developing a depressogenic cognitive style, it is interesting to speculate that the well-documented relationship between temperament and depression may be partially accounted for by the influence of temperament on the development of negative cognitive style; future research should further examine this hypothesis.

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